ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IMGASJ0210
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pyrgulopsis simplex*
COMMON NAME: Fossil Springsnail
SYNONYMS:
FAMILY: Hydrobiidae

AUTHOR, PLACE OF PUBLICATION: R. Hershler, and J.J. Landye. 1988. Arizona Hydrobiidae (Prosobranchia: Rissoacea). Smithsonian Contributions to Zoology. Number 459: 32.

TYPE LOCALITY: Spring near Strawberry, Gila County, Arizona

TYPE SPECIMEN: Holotype: USNM 859049. J.J. Landye, 16 October 1971.

TAXONOMIC UNIQUENESS: This genus comprises 35 described species and an additional 20-25 undescribed species in the Southwest.

DESCRIPTION: Moderate size species with shell height (height from top of shell to bottom of shell) of 2.0 to 2.5 mm with ovate-conic shell. The shell has 3.5-4.25 unshouldered and moderately convex whorls. Sexual dimorphism was significant in one of the two populations studied. Snout unpigmented, sides of head/foot with light dusting of melanin. All hydrobioids have a foot with a rounded posterior end. Penial filament darkly pigmented along virtual entirety of length.

AIDS TO IDENTIFICATION: Due to the small size of this animal, it cannot be identified to species in the field but must be identified in a laboratory by a qualified authority. Therefore, to obtain specimens, sift sand believed to contain the snail through an ordinary kitchen strainer. Rule of thumb that spring snail species are specific to a particular location (i.e. a single spring or group of springs connected or close to each other), may be used as a means of preliminary identification. The penial filament of *P. simplex* is shorter than that of *P. sancarlosensis*, but longer than those of *P. conicus* and *P. morrisoni*.

ILLUSTRATIONS: Photographs of shells (Hershler and Landye, 1988)
Line drawings (Hershler and Landye, 1988)
SEM micrographs of radula (Hershler and Landye, 1988)
Line drawings (Hershler and Ponder, 1998)

TOTAL RANGE: Spring near Strawberry, Gila County, along with Fossil Springs, Yavapai County, Arizona.

RANGE WITHIN ARIZONA: See "**Total Range**".

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The hydrobioid digestive system is typical of style-bearing neotaenioglossans. The mouth opens to a short oral area containing a pair of dorsolateral chitinous jaws composed of small, simple rodlets, immediately behind which is a well-developed buccal mass (situated within the snout). A pair of simple, unbranched, tubular salivary glands opens anterodorsally to the buccal cavity and (almost always) pass posteriorly over the nerve ring, rarely stopping short of the ring, but never passing through it in hydrobioids. Hydrobioids have a taenioglossate radula (i.e., seven teeth per row) comprising numerous rows of cuspate teeth, each of which includes a typically squarish or trapezoidal central tooth flanked on each side by lateral, inner marginal, and outer marginal teeth. Teeth near the anterior end of the radula are often worn or broken, whereas the proximal portion of the ribbon has several to many rows of poorly differentiated or incompletely formed teeth. (Hershler and Ponder, 1998).

REPRODUCTION: Most hydrobioids are oviparous, with females depositing small egg capsules, either singly or (rarely) in strings, on the substrate. A small number of hydrobioids are ovoviviparous, in which female's brood shelled young in the pallial gonoduct. Hydrobioid egg capsules are typically hemispherical to spherical. Copulation in hydrobioids is usually via an anterior opening to the glandular oviduct. The ventral channel may be traversed at least in part by the penis, but it is more likely that the penis only enters the anterior most section. (Hershler and Ponder, 1998).

FOOD HABITS:

HABITAT: They are typically found only in the headspring and upper sections of the outflow. The genus *Pyrgulopsis* is generally found on rock or aquatic macrophytes in moderate current. Because springsnails have only a partial operculum, they cannot withstand any desiccation, and occur only in water that is perennially flowing.

ELEVATION: 4,140 - 4,310 ft. (1262 - 1315 m).

PLANT COMMUNITY: Unknown.

POPULATION TRENDS: Fossil springsnail had experienced no apparent reduction in range or abundance as a result of activities in the Fossil Creek watershed during the past two decades.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None (USDI, FWS 1996)
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]

STATE STATUS: None

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3 1999)
Bureau of Land Management Sensitive (USDI, BLM AZ 2000, 2005)

MANAGEMENT FACTORS: **Threats:** water development activities; deterioration or disappearance of natural habitats. **Management needs:** protection of spring source; periodic monitoring of snail populations and their habitats.

PROTECTIVE MEASURES TAKEN: Fossil springs was recently designated a Botanical Area by the Coconino National Forest, an action designed to provide increased protection and restoration of the area. Public access to Fossil Springs is limited to foot travel, however, other springs in the watershed containing the Fossil springsnail are provided no special protection.

SUGGESTED PROJECTS: More studies on life history, morphology, and habitat requirements are needed.

LAND MANAGEMENT/OWNERSHIP: USFS - Coconino and Tonto National Forests.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Hershler, R. and J.J. Landye. 1988. Arizona hydrobiidae (prosobranchia: rissoacea). Smithsonian Contributions to Zoology. Number 459: 32

Hershler, R. and W.F. Ponder. 1998. A Review of Morphological Characters of Hydrobioid Snails. Smithsonian Institution Press, Washington D.C.

NatureServe Explorer: An online encyclopedia of life [web application]. 2003. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: http://www.natureserve.org/explorer. (Accessed: November 18, 2003).

Stefferud, J. 1995. Fossil Springsnail, *Pyrgulopsis simplex*. Presented at the Tonto National Forest Aquatic and Riparian Ecosystem Workshop, Mesa Arizona, April 18-19, 1995.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.

USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.

USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225): 58822.

USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 59(219): 59006.

USDI, Fish and Wildlife Species. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Bob Hershler - Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Jerry Landye - USDI, Fish and Wildlife Service, Pinetop, Arizona

ADDITIONAL INFORMATION:

Revised: 1992-03-24 (DBI)
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